DOCUMENT RESUME

ED 402 992 JC 970 062

AUTHOR Cross, K. Patricia
TITLE Educating the Work Force for the 21st Century.
PUB DATE 25 Jan 97
NOTE 23p.; Paper presented at the International Community College Workforce Development Conference sponsored by the National Initiative for Leadership and Institutional Effectiveness (Charlotte, NC, November 3-5, 1996). Cover title varies.
PUB TYPE Viewpoints (Opinion/Position Papers, Essays, etc.) (120) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Access to Education; *Classroom Research; *College Role; *Community Colleges; Cooperative Learning; Evaluation Methods; *Futures (of Society); *Instructional Improvement; Labor Force Development; Teaching Methods; Two Year Colleges

ABSTRACT

Since community colleges play such a key role in meeting the needs for workforce development as well as open access to education, considerable pressure is placed on the colleges to demonstrate their effectiveness. Recently, the focus of assessment in community colleges has shifted from gathering data that legislators and accrediting agencies want to collecting data needed by the college itself to improve quality. This shift recognizes that teachers and students are the legitimate audience of assessment research, since they are directly responsible for the quality of learning. While students are rarely involved in the assessment process beyond their function as subjects, growing numbers of teachers have involved them in the learning process, adopting active, student-centered forms of instruction. To ensure that feedback is received from students, Classroom Assessment Techniques (CAT) have been developed involving students and teachers in collaborative assessment of classroom learning. The most well-known CAT is the minute paper, in which students evaluate what they learned at the end of each class. To understand the results obtained from such exercises, teachers should employ classroom research, or the systematic study of students in the process of learning. This research should be embedded in the regular work of the class and should lead directly to changes in the practice of teaching. Contains 13 references. (HAA)

Teaching and Learning in the 21st Century

K. Patricia Cross
University of California, Berkeley

Paper presented at the International Community College Workforce Development Conference sponsored by the National Initiative for Leadership and Institutional Effectiveness (Charlotte, NC, November 3-5, 1996).

EDUCATING THE WORK FORCE FOR THE 21ST CENTURY*

K. Patricia Cross
David Pierpont Gardner Professor of Higher Education
University of California, Berkeley

In less than five years, the calendar will turn the page and open on not only a new year, but a new decade, a new century, and a new millennium! While much is being made of "the biggest deal in a thousand years," the year 2000 is only a number. But it is a number that seems to bring forth an unusually abundant rash of predictions about what the new century will bring to education -- or more importantly what the new century will require from education.

Everything we know about the future suggests that education will be the most important and potentially high-return investment that anyone -- individual, corporation, or nation -- can make in the future. As Governor Lamm put it in his book entitled, Megatraumas, "The future of a nation and its productivity depends on the knowledge and skill of its workers. No other resource even approaches an educated citizenry as our most valuable one." (Lamm, 1985, p. 121)

This international conference on Work Force Development is of special significance to educators throughout the world because community colleges are especially well-positioned by expectation, experience, mission, and location to assert powerful leadership in developing the new workforce,. This conference presents a timely challenge for colleges and every person associated with them -- faculty, administrators, trustees, and students -- to

* Presented at the International Community College Work Force Development Conference, Charlotte, NC, November 3, 1996

think about their particular contribution to the fullest possible development of our most precious natural resource -- human imagination, intelligence, and skill.

A decade ago this nation was jolted into major concern about the quality of its education by the publication of A Nation at Risk. (National Commission on Excellence in Education, 1983) You will no doubt remember that the report was so bombastic and colorful in its language and so compelling in its evidence that it received a great deal of press and television coverage. It spoke dramatically of the "rising tide of mediocrity that threatens our very future as a Nation and a people," and it warned that Americans, in their toleration of poor schools, had "been committing an act of unthinking, unilateral educational disarmament." (p.5).

The title of the report -- A Nation at Risk -- as well as its content, presented education as an investment in the future of the nation. "The time is long past," said the report, "when America's destiny was assured simply by an abundance of natural resources and inexhaustible human enthusiasm, and by our relative isolation from the malignant problems of older civilizations. The world is indeed one global village . . . Knowledge, learning, information, and skilled intelligence are the new raw materials of international commerce. . . Learning is the indispensable investment required for success in the 'information age' we are entering." (p. 6-7)

While almost everyone is aware of the growing importance of education in the coming Learning Society, there seems to be a gap between the perception of the general public, who look at education as a personal investment, and employers and legislators, who look at education as a societal investment. A recent poll in California, commissioned by the California Higher Education Policy Center, found that the general public

believe that a college **degree** is necessary as a ticket to a good job, and thus they are greatly concerned about cost and access. But they are not convinced that a college **education** is necessary in order to perform well in a good job. Actually, according to the survey, a majority of the general public feel that society has made college seem more important than it really is. Leaders in the state, however, are convinced that the quality of learning at least as important as the certificate, and they are echoing the concerns raised in A Nation at Risk.

Public policy during the latter half of the 20th century has been directed largely toward assuring access to college, and community colleges have been the nation's primary answer to the demand for vastly increased educational opportunity. In the late 1960s, community colleges were established at the rate of a new college somewhere in the nation each week; 400 new community colleges were founded between 1967 and 1977. That was the access revolution, and it dominated the public agenda for higher education for half a century.

The new century opens on a different scene. Employers, no longer trustful of the certificate, are demanding an educated workforce -- workers who can read and compute and think and solve problems. And there is considerable pressure on colleges today to demonstrate their effectiveness in producing such students.

In 1986, the National Governors' Association published a report ominously titled, Time for Results. It implemented the message in A Nation at Risk by calling for the assessment of student learning. The section on higher education was introduced with these words: "The public has the right to know what it is getting for its expenditure of tax resources; the public has a right to know and understand the quality of undergraduate education that

young people receive from publicly funded colleges and universities." (National Governors' Association, 1986, p. 154) The intent is clear; the nation, the state, and individual students are going to be "at risk" without some evidence that higher education is moving toward producing the kind of learning that is required for the 21st century.

In the early years of assessment, most colleges felt pressure to do assessment primarily in order to satisfy the demands being made by state legislators and accrediting agencies. The compelling question for assessment planners was, What do THEY want? What sort of data must we collect to satisfy the requirements of accreditation review or state mandates? The new question emerging on many campuses is, What do WE want to know about student learning in order to improve the quality of education on this campus? Collecting assessment data on student learning for report to external others is one thing; collecting it for internal use in making changes is quite another. What happens on campus when the priority of assessment shifts from doing assessment to using it to improve student learning?

Let's start with the obvious, but often ignored, fact that the folks who are actually able to do something to improve learning are teachers and students. Although assessment has many audiences, including legislators, accreditors, and the general public, in the final analysis, it is teachers and students, working together, who are ultimately responsible for the quality of learning.

Most institutions have worked conscientiously to get faculty involved in assessment and that is hard enough, but students are rarely involved after they provide the data for analysis. Students are usually considered the subjects of the assessment; rarely do we report the data back to them and attempt to involve them in the implementation. But I think that we must

begin to include students as equal partners, sharing with faculty and administrators responsibility for the quality of learning. Students can easily be included in the entire assessment process, and there are two reasons why I think they must be:

First is the obvious one that we can't improve student learning without the active and intelligent participation of students themselves. But second, and equally important, is the fact that students as lifelong learners are going to have to learn to assume major responsibility for the direction and quality of their own learning. It is already the case that for most of a student's learning life, we -- the formal educational establishment -- are not going to be directing where, when, or what they learn. Today's students must, of necessity, become lifelong learners. Knowledge is changing so fast that what students know when they graduate from college is not nearly as important as what they are capable of learning. The half life of knowledge in medicine now -- meaning the time it takes for half of the knowledge to become obsolete -- is reputed to be about five years. That means that by the time students graduate from medical school, half of the knowledge of their profession has been replaced by new knowledge. How can we possibly educate people for that sort of sea change? Information is more plentiful, more easily available, and more rapidly distributed than ever before in the history of the world. We are quite literally awash in information. Between 6,000 and 7,000 scientific articles are written each day. Scientists complain that they are so overwhelmed with data and information that it takes less time to do an experiment than to find out if it has been done. (Naisbitt, 1982 p. 24) John Naisbitt claims that for professional and clerical workers -- and that includes the majority of all workers today -- the creation, processing, and distribution of information <u>is</u> the job (p. 15).

The most important thing any student can learn in college today is how to become a lifelong learner. That means mastery of the basic tools for learning -- reading, writing, numeracy, critical thinking, problem solving, of course, but it also means developing the attitudes and values of the lifelong learner -- cultivating an appreciation of learning and acquiring the habits of a self-directed learner.

Shortly after A Nation at Risk launched the educational reform movement in 1983, a report specifically concerned about the quality of learning in higher education suggested ways in which the research of the past several decades could be used to improve undergraduate education. The researchers who prepared the report concluded that, " the quality of undergraduate education could be significantly improved if America's colleges and universities would apply existing knowledge about three critical condtions of excellence -- (1) student involvement, (2) high expectations, and (3) assessment and feedback." (Study Group on the Conditions of Excellence in American Higher Education, 1984, p. 17)

We hear a lot today about the necessity for student involvement in their learning -- that students must be actively invloved in thinking, questioning, trying out their skills, etc. And there is some evidence from the latest poll of 34,000 faculty members that college teachers are changing their teaching methods to more active student-centered forms of instruction. Group projects and cooperative learning are on the increase while lecturing is on the decline.(Sax, Astin, Arredondo, & Korn, 1996) It appears that faculty are working hard to implement the first condition of excellence by involving students more actively in their learning. As for the second condition of excellence, friends and critics alike have concluded that we don't expect enough of students, but expectations are on the rise, partly at

least because community colleges have demonstrated that given appropriate opportunity and help, students can learn to set and achieve high levels of performance. The third condition for excellence, providing assessment and prompt feedback, is only partially practiced today. Assessment is encouraged and enforced by accrediting agencies and state offices. What hasn't received much attention to date is the importance of feedback, and that is what I want to talk with you about today since I believe that feedback to students on their progress as learners and teachers on their effectiveness as teachers is not only critically important, but it is something that can be done easily and effectively within the everyday conditions of the classroom.

As some of you know, my colleague, Tom Angelo, and I have been working with college teachers from all kinds of colleges and from across the disciplines to develop some Classroom Assessment Techniques (CATs) that involve teachers and students in the joint and collaborative assessment of classroom learning. (Angelo & Cross, 1993) The purpose of CA is to inform teachers how effectively they are teaching and students how effectively they are learning. Through CA, teachers get continuous feedback on what and how well students are learning what teachers hope they are teaching. And students are required, through a variety of classroom assessment exercises, to monitor their learning, to reflect on it, and to take action while there is still time left in the semester to make corrections.

Let me give an example of CA's most famous CAT. It is called the Minute Paper, and it works like this: Shortly before the end of selected class periods, the instructor asks students to write brief answers to these two questions: (1) What is the most important thing that you learned in class today? and (2) What is the main, unanswered question you leave class with today?

Like most CATs, the Minute Paper is a teaching tool as well as an assessment device. It requires students to stop and think about what they have learned, to synthesize and articulate an important piece of learning, to express themselves in writing, and to think actively about what they did not understand. In short, it engages students in evaluating their own learning. If students are told that the Minute Paper is going to be requested at the end of a given class session, they may ask themselves along the way what they are learning, and they tend to be more involved and more active in sorting out the major message. So, even if the instructor failed to learn something important about students' responses to the teaching of that class session, the Minute Paper would still be worthwhile for students, requiring them to reflect on their learning experience.

But teachers do learn a great deal from the feedback of the Minute Paper. Dick Light, the director of the Harvard Assessment Seminars, reported that "This extraordinary idea is catching on thoughout Harvard. Some experienced professors comment that it is the best example of high payoff for a tiny investment that they have ever seen." (Light, 1990, p. 36) Light reported at the AAHE national assessment conference in Washington, D.C. this summer that the Minute Paper is now used in more than 400 classes at Harvard.

CATs come in many varieties; they can be used to assess learning skills and attitudes, motivation, reactions to teaching and class activities, and almost anything else that would provide some insights into what students are learning and how they are responding to the class. In our handbook on Classroom Assessment Techniques, we describe 50 CATs that are presented like recipes that can be adapted and changed to fit any classroom. But the

best CATs are invented by teachers to answer the questions that they have about their own teaching and their students' learning.

For example, a writing teacher modified the Minute Paper to get some idea of what students were learning from the small-group work sessions that she used to engage students in critiquing one another's papers. She asked students to answer these two questions when they had finished their group-work session: 1) What specific suggestions did members of your group offer to you that are likely to help you improve your draft essay? and 2) What suggestions did you offer to others that are likely to help them improve their draft essays?

The good news is that she found that most students mentioned things they had learned from others that they thought would improve their papers. The bad news is that only 3 out of 24 students could think of something they had offered that might have been helpful to the other students in their group! What became clear to this teacher was that, for all our talk about the advantages of collaborative learning, students don't automatically know how to reap the benefits of cooperative learning.

At this point, the teacher had several different options about the level of her involvement in teaching students how to make the small group sessions more productive. She might let the CAT do the pedagogical work of reminding students that they are expected to contribute as well as to benefit from the work of the group sessions. For students, just having to write out the benefits of the group sessions is a gentle reminder of the two-sided obligation of collaborative learning. At a somewhat higher level of involvement, the teacher might spend a little time in class discussion, eliciting suggestions from students about how the group work might be made more productive. Or she might decide to get more heavily involved yet by

devising some learning exercises that teach students to critique other's papers helpfully. In any case, this illustrates an important instructional use of CATs. CATs can be used to involve students in monitoring their own learning and thinking about how they can be more productive.

The Minute Paper is used, I think, first because it simple and easy to administer, but more fundamentally because it provides immediate feedback to both teachers and students about the learning that is taking place-- or not taking place -- in any given classroom while it is still fresh in everyone's mind. Feedback is probably the single most important ingredient in improvement, whether used by teachers to improve their teaching or students to improve their learning. Consider, for example, the role of feedback in learning a skill such as archery.

Imagine a group of people who are trying to learn archery in a darkened room where both the target and feedback on hitting it are invisible. The archers may be provided with the best and most sophisticated equipment that money can buy; they may have one-on-one coaching from an expert teacher, and they may have access to good library materials on the history and practice of archery. Despite all this quality education on the input side, it's pretty clear that they are not going to improve their performance until they get some feedback on whether they are hitting the target.

We don't pay a lot of attention right now to giving students feedback on their progress as learners. Throughout most of their school years, students get grades that tell them how they have done relative to their classmates. That sort of information is not useful feedback on their progress as learners, nor does it do anything to help students develop the skills they need for self-assessment as lifelong learners. Classroom Assessment is a

useful tool because it defines the target and provides useful feedback to students on their progress in hitting it.

So, if quality learning is the priority for the 21st century -- and I think it is -- teachers and students need to be primary players in assessment, and they need to be able to use the results of the assessment to improve their own performance. Now, what is it that they need to know?

Returning to the archery analogy, they need to know what and where the target is, and they need prompt feedback on whether they are hitting it or not. CA can be targeted to provide feedback on whether students are accomplishing the goals that the teacher has in mind, but CA can also provide feedback on where student arrows are going astray. Are student arrows hitting the barn to the left of the target, the ground in front, or perhaps students are scattering arrows all over the place. If feedback from the Minute Paper tells a teacher that students have no idea what the major message of the class session was or if student perceptions are distressingly different from teaching intentions, then a teacher wants to know why. For that we need Classroom Research.

When I use the term "Classroom Research," I am not talking about research with a capital R to mean heavily-funded, discipline-based, publication-conscious, Ph.D.-type research that typically takes teachers **out** of the classroom and into the laboratory or library to do their research. Rather, I am using "research" in the simple dictionary definition of the term to mean, "careful, systematic, and patient study." Classroom Research is the careful, systematic, and patient study of students in the process of learning, and more specifically of how students are responding to our efforts to teach them.

When we first started our work, we used the terms Classroom Assessment and Classroom Research almost interchangeably, but we are now beginning to stress important distinctions between Classroom Assessment and Classroom Research. Classroom Assessment usually addresses the status quo or "what" questions of teaching and learning. What is going on in this class today? What did students learn from the day's lesson? What did they fail to understand or what did they have further questions about?

Classroom Research, in contrast, attempts to answer questions having to do with understandings -- the "why" and "how" questions about learning. Why did students respond as they did? Why did they hit the barn instead of the target? Why do they seem to have such foggy notions of where the target is? Broadly speaking, Classroom Research attempts to provide some insight into how students learn. It encourages teachers to use their classrooms as laboratories for the study of learning. (Cross & Steadman, 1996)

Note that the emphasis in Classroom Research is on observing students in the act of learning rather than on observing teachers in the act of teaching. For the past several decades, staff development programs have helped teachers look at their teaching skills -- often in the absence of learners. In such programs, teachers and teaching become the objects for analysis and study. In CA and CR, students and learning are the objects of study under the assumption that teaching skills are developed when their impact on learning is studied.

Few college teachers know much about the learning process. For the most part, they have only their own experience as learners to guide them. And for most who choose academic life, learning has came easily. Almost

by definition, academics find learning enjoyable, and they are successful at it. Such is not the case for many of today's students. The access revolution brought thousands of students into college classrooms who find academic learning difficult and threatening. If we in higher education are serious about maximizing student learning, then teachers are going to have to know more about how the students in their own classrooms learn. And one way to do that is to carefully and systematically observe their own students in the process of learning the particular subject matter that the teacher is trying to teach.

Faculty engaging in Classroom Research have much to contribute to our growing knowledge about human learning. There is an urgent need for research on teaching and learning in the disciplines. Lee Shulman (1986) of Stanford claims that there is a blind spot in most of the current research on teaching with respect to the importance of subject matter content. Teaching English at the college level is clearly different from teaching math. In fact, in our own research on teaching goals (Angelo & Cross, 1993), we found that faculty teaching priorities are related more to subject matter taught than to any other factor. Teachers of a given discipline -- whether male or female, full-time or part-time, experienced or inexperienced, teaching in a public community college or a private four-year college -- share a value system with respect to teaching goals that is distinctively discipline-related and significantly different from that of colleagues in other disciplines.

While there are many characteristics that good college teachers share in common, and teachers can and should learn those generic teaching skills, it is quite clear that at the college level there is an enormous need for research on teaching in the disciplines. And no one is better qualified to do such research than college teachers who know their discipline and the

problems in teaching it to others. As community college teachers, you have a particularly good opportunity to observe both the stumbles and triumphs of learning because of the rich diversity of your student populations. The bright side of the concentration of students with learning problems in community colleges is that sometimes the best way to understand a process is to look at what goes wrong when things aren't working right. Students with learning difficulties -- whether stemming from lack of background knowledge, lack of basic skills, low motivation, or whatever -- can try the patience of a saint or they can serve as windows through which to view the complexities of human learning.

I believe that as we close out this century, all the pressures and interests are converging to make teaching a scholarly profession. It is not such now. Most college teachers teach as they were taught without much knowledge about its impact on student learning. The profession of teaching, especially at the college level, is poorly developed. We are not standing on the shoulders of giants in advancing knowledge and improving practice with each new generation of teachers. Professor Lee Shulman has pointed out that teaching is one of the few professions that lacks a "wisdom of practice" (Shulman, 1987) Most professions -- at least the most esteemed professions -- build on the knowledge of previous generations. Architects leave behind buildings; law has its cases; medicine has internships and "rounds;" engineering has bridges and roads. All of this accumulated "wisdom of practice" can be preserved and studied by future generations. We learn something when bridges and buildings collapse in an earthquake, and we build them better the next time around. But the wisdom of practice in teaching ends with the career of the individual teacher. If we are to develop a profession of teaching that goes beyond the experience of the

individual, then a knowledge base must be built through patient and persistent study of the impact of teaching on learning.

Classroom Research differs in many ways from traditional research in or on classrooms. In the first place, it is not an add-on activity. It is embedded in the regular ongoing work of the class. At its best, Classroom Research involves students as collaborators rather than subjects in the research. Knowledge about human learning, especially their own, is of high value and high interest to students. They are eager collaborators and the payoff for them is great in that they gain insight into their own learning while also developing the academic skills of inquiry and analysis.

Most importantly, Classroom Research differs from traditional educational research by completing the cycle from formulating the question to making changes in the practice of teaching. The typical pattern in traditional educational research has been for the investigator to do a research project, write up the findings, and publish them along with recommendations for someone else to carry out. This has been a notoriously ineffective design for the improvement of teaching and learning. Teachers are far too busy to read reports of research that seem to result in equivocal findings that may or may not apply to their students or their classrooms. One of the primary advantages of Classroom Research is that it is, by definition, relevant. It calls for the invention of a research question that the teacher finds interesting and important. And it is conducted in the relevant classroom, with the relevant students, in the relevant discipline. Let me give an example of a Classroom Research project cycle.

This example might start with an assessment using a CAT known as the Diagnostic Learning Log. It asks students, usually as part of a

homework assignment, to analyze their own learning process by answering a few questions such as these about the homework assignment:

1. Briefly describe the assignment you just completed. What do you think was the purpose of this assignment?

2. Give an example of one or two of your most successful responses. Explain what you did that made them successful.

3. Provide an example of where you made an error or where your responses were less complete. Why were these items incorrect or less successful?

4. What can you do differently when preparing next week's assignment? (Cross & Steadman, 1996, p. 69)

The teacher might then prepare a tabulation of the responses, and together teacher and students would analyze the data. How well was the purpose of the assignment understood? Where did misunderstandings occur What did students consider successful responses and why? Are there some common themes in the successful responses? Where were errors made? Are they common errors? To the extent that the assignment is typical or recurring, students will be interested in knowing how others are responding, and the project itself is both a learning experience and a descriptive study of the processes that are being used by students in the class.

Note that this design starts out fitting the definition of a traditional descriptive study; it tells how students responded to a brief questionnaire about a given assignment. But instead of stopping with the tabulation of the data -- for example, 42 percent of the students misunderstood question 3-- Classroom Research gives both teacher and students an opportunity to analyze the learning process. Interested and creative teachers will almost

certainly find any number of questions and hypotheses for further investigation.

Consider, for example, the rich research possibilities involved in relatively simple data such as student responses to the question, "What do you think the purpose of the assignment is?" It is my guess that an insightful analysis of students answers' to that question would reveal considerable disparity. Some students would no doubt think the purpose of the assignment was to find the answer or to reproduce the information given in the assignment. Other students might think it was to understand a relationship or to critique an argument. Such observations tie into some interesting research being done in the UK, primarily England and Australia, right now on deep versus surface learning. Surface learning refers to learners' attempts to reproduce information provided by others (often with the least possible effort), whereas a deep approach to learning refers to learners' attempts to understand and apply new information.

I confess that I have been lurking on the internet this summer, as teachers from a wide variety of colleges across an array of disciplines trade insights, observations, and references about deep versus surface learning (isl@mailbase.ac.uk). The conversations are lively, and the questions these classroom teachers raise and the observations they make about their own teaching experiences furnish ample grist for any number of interesting research projects. Sharing information and insights via publications or the internet is itself a short-term reward, but in carrying out a relatively simple Classroom Research exercise, both teacher and students are engaging in the type of learning analysis that has long term benefits. Research shows clearly that people who are aware of themselves as learners, that is who can watch

themselves in the process of learning and analyze their responses, are better learners than those who are less aware of how they learn.

Another source of useful information that is free to CRers -- and rarely available to professional researchers -- comes to office hours in the form of students with questions. Our usual response as teachers, is to find out what they need explained and set about explaining it -- often in the same way that did not work in the assignment or lecture. But that is the response of the teacher. The response of the researcher is different. The researcher is more likely to listen than to talk -- to probe for insights about learning, to try to understand where the "disconnect" is between the presentation and the student's understanding. Sometimes, given half a chance to analyze their own learning, students will be remarkably insightful and articulate about a learning problem. More often, the researcher may need to launch some probing hypotheses, leading both researcher and student to a more analytical look at the learning process.

Fortunately in Classroom Research, an "N of one" may be more valuable than the N of hundreds needed to assure statistical significance in more traditional correlational research. An interview with a single student, or a focus group with a small number of students, or a discussion in a small class or seminar is more likely to result in an understanding of the process of learning than is a statistical study that may only tell us that certain things seem to be related. Worse yet, many traditional research studies are based on what Benjamin Bloom (Bloom, 1980) has called "unalterable variables" -- variables such as age, ethnic background, and gender, that educators can do nothing to change. Granted, we may need to adapt to non-traditional unalterable characteristics, but they are not very helpful in understanding learning as a process. CRers are more interested in alterable variables, such

as study strategies, teaching techniques, motivation, and other educational variables that can be changed by understanding and a willingness to learn about learning.

Classroom Research, if it is to be effective, requires the careful launching and testing of insightful hypotheses. Its primary requirement is that it should benefit the participants, namely teachers and students, but it should also be related to broader themes about learning, themes that exist in the literature on learning and in the experiences and experiments of teaching colleagues. .

And that brings me to some concluding comments about the Classroom Research community. Research is often considered a solitary activity taking teachers out of the classroom to the lab or library to do their work in isolated splendor. While it is perfectly possible to do Classroom Research within the confines of one's own classroom, we are finding that once faculty start down the road of Classroom Research, they are eager to share the experience with their colleagues. After all, teaching is one thing that faculty have in common. It is a paradox that teaching in higher education is such a strangely private affair. It is learned in private and for the most part practiced in private without much input or conversation with others engaged in the same activity.

Classroom Research provides a stimulus to forming a community around the mission that all colleges and universities share, and that is teaching. At the first level, there is the collaboration and discussion with students about learning, which is, after all, the common purpose shared by teachers and students. At the next level, there is departmental and inter-departmental research about student learning, which is the common purpose of departments and divisions. At still another level, there is the community

formed by the disciplines. There are now more than 50 discipline-specific pedagogical journals such as Physics Teacher, Teaching of Psychology, Research in the Teaching of English, Journal of Nursing Education, and the like, (Weimer, 1993) Classroom Research can only be enhanced by sharing both the investigations and the outcomes with students and teaching colleagues through pedagocial publications, presentations at conferences such as this one, through conversations on the internet, and through on-campus colloquia and seminars

In conclusion, I believe that college teaching is a profession that will come into its own in the 21st century. The members of a profession are bound together through sharing a base of knowledge and experience that makes them qualified to exercise judgment and skill in the practice of their profession. Strangely missing from the profession of teaching as we close out this century, is the ability to advance the profession through a shared base of knowledge about human learning. Classroom Research has the potential for creating teaching/learning communities with the shared goal of understanding learning well enough to improve it as individual classroom teachers and as faculties of colleges dedicated to the mission of teaching.

REFERENCES

Angelo, T. A., & Cross, K. P. (1993). Classroom Assessment Techniques: A Handbook for College Teachers, Second Edition. San Francisco: Jossey-Bass.

Bloom, B. (1980). The New Direction in Educational Research: Alterable Variables. Phi Delta Kappan (Feb.), 382-385.

Cross, K. P., & Steadman, M. H. (1996). Classroom Research: Implementing the Scholarship of Teaching. San Francisco: Jossey-Bass.

Lamm, Richard D. (1985) Megatraumas: America at the Year 2000. Boston: Houghton Mifflin.

Light, R. J. (1990). The Harvard Assessment Seminars. Cambridge, MA: Harvard University.

Naisbitt, J. (1982). Megatrends. New York: Warner Books.

National Commission on Excellence in Education (1983). A Nation at Risk. Washington, D.C.: U. S. Department of Education.

National Governors' Association (1986). Time for Results. Washington, D.C.: Center for Policy Research and Analysis.

Sax, L. J., Astin, A. W., Arredondo, M., & Korn, W. S. (1996). The American College Teacher: National Norms for the 1995-96 Faculty Survey. Los Angeles: Higher Education Research Insititute, UCLA.

Shulman, L. S. (1986). Those Who Understand: Knowledge Growth in Teaching. Educational Researcher, 15(2), 4-14.

Shulman, L. S. (1987). Knowledge and Teaching: Foundations of the New Reform. Harvard Educational Review, 57(February), 1-22.

Study Group on the Conditions of Excellence in American Higher Education (1984). Involvement in Learning: Realizing the Potential of American Higher Education. Washington, D.C.: National Institute of Education.

Weimer, M. (1993). The Disciplinary Journals on Pedagogy. Change, 25(Nov/Dec), 44-51.

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
Educational Resources Information Center (ERIC)

ERIC®

JC970062

REPRODUCTION RELEASE

(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: Teaching and Learning in the 21ST Century

Author(s): K. Patricia Cross

Corporate Source:

Publication Date: NOV, 1996

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, *Resources in Education* (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic/optical media, and sold through the ERIC Document Reproduction Service (EDRS) or other ERIC vendors. Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following two options and sign at the bottom of the page.

[X]

Check here
For Level 1 Release:
Permitting reproduction in microfiche (4" x 6" film) or other ERIC archival media (e.g., electronic or optical) *and* paper copy.

The sample sticker shown below will be affixed to all **Level 1** documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Level 1

The sample sticker shown below will be affixed to all **Level 2** documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN OTHER THAN PAPER COPY HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Level 2

[ ]

Check here
For Level 2 Release:
Permitting reproduction in microfiche (4" x 6" film) or other ERIC archival media (e.g., electronic or optical), but *not* in paper copy.

Documents will be processed as indicated provided reproduction quality permits. If permission to reproduce is granted, but neither box is checked, documents will be processed at **Level 1**.

"I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic/optical media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries."

Sign here→ please

Signature: K. Patricia Cross

Printed Name/Position/Title: K. PATRICIA CROSS, PROFESSOR, UNIV. OF CALIFORNIA, BERKELEY

Organization/Address: 904 OXFORD ST BERKELEY, CA 94707

Telephone: (510) 527-9020

FAX: (510) 527-9020

E-Mail Address: Patcross@violet.berkeley.edu

Date: 1/25/97

III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, *or*, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor:
Address:
Price:

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:
Address:

V. WHERE TO SEND THIS FORM:

Send this form to the following ERIC Clearinghouse:

Rika Nakazawa, Acquisitions Coordinator
ERIC Clearinghouse for Community Colleges
3051 Moore Hall
Box 951521
Los Angeles, CA 90095-1521

However, if solicited by the ERIC Facility, or if making an unsolicited contribution to ERIC, return this form (and the document being contributed) to: